CLAIMS

I claim:

1. A computing system comprising:

a first general purpose microprocessor having a first set of native instructions;

a first random access memory coupled to said first general purpose microprocessor;

a first virtual machine disposed in ROM, and executed by said first general purpose microprocessor;

a first predetermined subset of said first set of native instructions, wherein instructions in said first predetermined subset are likely to result in defects when executed;

a first virtual machine instruction subset, which includes said first set of native instructions, except for said first predetermined subset; said first virtual machine instruction subset is used by said first virtual machine; and,

said first virtual machine has received a certification by the FAA, in response to a written claim of an improved assurance level, based, at least in part, upon a reduction in contents of said first virtual machine instruction subset in relation to said first set of native instructions of said first microprocessor.

2. A system of claim 1 further comprising:

a first FAA certified avionics application running on said first virtual machine.

3. A system of claim 2 further comprising:

a second general purpose microprocessor which is dissimilar with respect to said first general purpose microprocessor;

a second virtual machine executed by said second general purpose microprocessor; and,

means for synchronizing and voting outputs of said first general purpose microprocessor and said second general purpose microprocessor.

4. A system of claim 3 wherein said second virtual machine executes said first FAA certified avionics application.

5. A system of claim 4 wherein said second virtual machine utilizes a second virtual machine instruction subset, and said second virtual machine has received a certification by the FAA, in response to a written claim of an improved assurance level, based, at least in part, upon testing of said second virtual machine instruction subset.

6. A system of claim 5 wherein said first and said second virtual machine are distinct compiled versions of an identical original virtual machine code.

7. A system of claim 6 wherein information is simultaneously provided to said first and said second general purpose microprocessors, via a single source of information.

8. A system of claim 7 wherein outputs of said first and second microprocessors have reduced temporal drift with respect to each other as a result of simultaneous receipt of information to be processed therein.

9. A system of claim 8 wherein said means for synchronizing and voting outputs is a programmable logic device.

10. A system of claim 9 wherein said means for synchronizing and voting outputs is a programmable logic device without functions therein for interfacing with more than one compiled avionics application program.

11. A computing system comprising:

first means for processing a first native instruction set;

second means for processing a second native instruction set, wherein said second native instruction set is dissimilar with respect to said first native instruction set;

a first virtual machine operating on said first means for processing and generating first virtual machine outputs;

a second virtual machine operating on said second means for processing and generating second virtual machine outputs;

said first virtual machine and said second virtual machine being independently compiled applications originating from a single source application;

a first application being executed simultaneously by said first virtual machine and said second virtual machine; and

means for voting said first virtual machine outputs and said second virtual machine outputs to arrive at final outputs which have a higher assurance level, with respect to said first virtual machine outputs and said second virtual machine outputs when examined independently.

12. A system of claim 11 further comprising means for simultaneously providing information to be processed, to said first and said second virtual machines.

13. A system of claim 12 further comprising a shared memory which is not independently accessible from first means for processing and said second means for processing.

14. A system of claim 13 wherein said means for voting is disposed between said shared memory and said first and said second means for processing.

15. A system of claim 14 wherein said first means for processing is a first general purpose microprocessor.

16. A system of claim 15 wherein said first and said second virtual machines have been certified by an FAA official.

17. A system of claim 16 wherein said first and said second virtual machines each utilize instruction subsets which are less inclusive than said first native instruction set and said second native instruction set, respectively.

18. A system of claim 17 wherein a written claim of higher assurance has been made to said FAA official, where the written claim has a component thereof which relies upon a reduction in content of one of said instruction subsets in comparison to a content of said first native instruction set.

19. A method of processing information comprising the steps of:

providing a first general purpose microprocessor, for use on an aircraft, with a first virtual machine operating thereon;

providing a second general purpose microprocessor for use on an aircraft, with a second virtual machine operating thereon;

making a written claim to an FAA official, claiming that said first virtual machine operating on said first general purpose microprocessor results in an increased assurance level;

running an avionics application on said first and said second virtual machines and generating first and second outputs respectively;

voting said first and said second outputs to arrive at assurance enhanced outputs;

making a claim to said FAA official that said assurance enhanced outputs have a higher assurance level than said first outputs; and,

receiving a determination from said FAA official that said assurance enhanced outputs exceed predetermined assurance criteria.

20. A method of claim 19 wherein said avionics application is a flight management system application.